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Car crash data is in the bag

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There's no doubt that airbags save lives in car crashes

Your car's airbag can easily double as a black box recorder in the event of a crash. Why aren't we in the UK using this data to save lives? BBC News Online's technology correspondent Mark Ward reports.

They may not know it, but millions of car drivers are carrying a passenger that is quietly keeping an eye on their driving habits and recording any near-crashes they have.

The passenger is the box of sensors attached to every airbag that works out when a crash is a crash, and if the bag should be deployed.

At the moment of a crash the box also records and stores other information about a vehicle such as its speed, if the seat belts were fastened and the position of the control pedals.

Now moves are afoot to use the data recorders as so-called 'black boxes' to help crash investigators work out what happened in an accident, aid car manufacturers in making vehicles safer, and assist police forces prosecute those to blame for an accident.

The Royal Society for the Prevention of Accidents (Rospa) says it would welcome the move. "Any form of data recording is potentially a good thing, especially in terms of accident investigation," said a spokeswoman.

Airbags and accidents

Airbags were first introduced in 1974 but have only been widely used in the last decade. Ancestors of the sensors that are fitted to modern production cars were first tested on Indy race cars in the early 1990s. The data they gathered helped improve track safety.

The sensor boxes used in modern cars gather a wealth of information about how you drive. Typically the box takes fresh readings of such things as speed and control pedal positions every five seconds as well as recording the last 60 days of minor bumps and collisions.

The main sensor inside the black box is an accelerometer which measures sudden changes in velocity. To reduce injuries in a crash the control system for the accelerometer must decide whether an impact is a crash between 0.015 and 0.050 seconds of it occurring.

If a crash does happen the data regularly gathered by the black box is written to a memory chip so it cannot be erased or overwritten.

Data that airbag sensors can log
Pre-crash speed
Engine RPM
Accelerator position
Brake pedal position
Whether driver's seat belt was fastened
If car was started after airbag was deployed
Minor impacts that did not trigger the bag

Until recently car makers have been the only ones using the data recorded by the boxes to fine tune airbag deployment. Early airbags often wrongly deployed in cars being driven over bumpy roads. The sensors also record fault codes so if they go wrong, a mechanic can quickly make repairs.

Now police forces are starting to use the data stored in the sensors and more organizations are clamoring for access to the information to improve road safety. Road accident figures are falling, but Rospa figures reveal that 1,841 car drivers were killed and 229,588 were injured in crashes during 1998.

Since the late 1990s the Ontario Provincial Police has been using data gathered from airbag sensors to investigate crashes and, in some cases, prosecute those involved.

Sometimes the data gathered from black box contradicts statements given by drivers after an accident. In one case someone who claimed to be traveling at 100 kph was found to be driving closer to 150kph.

State and local police forces in the US are also turning to the black boxes to help with their crash investigations. Some say that often the black box is all that can speak for the victims.

Airbags have been used to make Indy car racing safer

Prompted by the action of police forces and the fact that the data can only be extracted with a search warrant, and then only for accidents involving serious injury or death, the US is now moving to make greater use of the data held by in-car black boxes.

Information extraction

The National Highway Safety Association is making car makers publish information about how to download and interpret information from the boxes. The US National Highway Traffic Safety Administration has set up a program to gather information about car crashes using data from sensor boxes.

So far the UK is not following suit. "There are no plans to make manufacturers share the information, because there is no standardized system for recording the data," said a spokesman for the Department of the Environment Transport and the Regions.

But a spokesman for the Transport Research Laboratories, which investigates car crashes, said the organisation would "love" to get at the data in the recorders but currently the manufacturers are keeping it to themselves.

"There's no generic system because it varies between models of car. It's not just one basic process for every device," said a spokesman.

"Any directive would have to come from government because of the legal and regulatory aspects. There are problems surrounding the extraction of the information in this country."

Some organizations are not waiting for guidance from government. Tachographs have been fitted in lorries and commercial vehicles for years and now the Metropolitan Police is fitting independent black boxes to 2,900 patrol cars in a bid to reduce the number of crashes and give drivers the training they need.

Rospa says company cars should be the next vehicles to have them fitted. "If drivers know the data could be used in court it could make them more careful and think about their driving," said a spokesman for the organization.

There is evidence that this is exactly what happens when a black box is fitted to a car. A study carried out by Professor Gunter Sabow from the German Institute of Traffic and the Environment on 1,600 young drivers, whose cars were fitted with the sensors separate to those on an airbag, found that it forced a change in driving habits and made them much safer.

Now the Transport Directorate of the European Commission is following up Professor Sabow's work to see what can be done across the continent to make people better drivers.